



No.	Author	Date
955	Steven E. Backs, Wildlife Research Biologist Title 2008 Spring Breeding Indices of Ruffed Grouse	5/20/08

**Abstract:** Ruffed grouse breeding populations are at extremely low levels. The 2008 drumming index for 8 survey control routes was 0.03 drumming males heard per stop (1 drummer heard/ 30 stops), less than 3% of levels recorded during the peak years of 1979-81. The 5-year mean drumming index (2004-2008) was 0.04 drummers per stop or approximately 1 drummer heard every 25 stops. For the third consecutive year, no drumming activity centers were located on the Maumee Grouse Study Area where population monitoring began in the early 1960's. Prospects for population recovery are poor given the continual advancement of forest succession and the lack of active forest management on public forestlands in south-central Indiana, the core and remnant range of the ruffed grouse in Indiana. Ruffed grouse population levels are projected to drop below "viable population levels" within the next decade, or sooner, in portions of their existing range in south-central Indiana unless some intervention (e.g. timber harvests of sufficient intensity) or sizable natural disturbances occur across the forested landscape to create early successional forest habitats.

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Ruffed grouse (*Bonasa umbellus monticola*.) breeding population indices (males heard drumming/stop) were estimated during the spring of 2008 along 10 roadside drumming trend routes in southern Indiana. The annual drumming activity center count was conducted at the Maumee Grouse Study Area located on Hoosier National Forest in Jackson/Brown counties. Roadside counts ranged from 0 to 0.13 male grouse (drummers) heard per stop (15 stops/route) (**Table 1**). No grouse were heard on 7 of the 10 routes and no grouse were observed along any of the routes.

The combined mean for the 8 control areas was 0.03 grouse heard per stop (Drumming Index; DI) or 1 male grouse heard every 30 stops. The drumming indices during the last 4 years are the lowest drumming indices in 31 continuous recorded years (**Table 2**), and the lowest DI's since roadside drumming surveys were initiated in 1953. The 5-year mean drumming index (2004 to 2008) was 0.04 drummers per stop or approximately one drummer heard every 25 stops. Drumming indices for the control routes indicate grouse breeding populations have declined fairly steadily the last 25 years and are now less than 3% of levels recorded during the peak years of 1979-81 when the mean drumming index was 1.16 or roughly 17 male drummers heard per 15-stop route.

Ruffed grouse population monitoring and other related research began on the Maumee Grouse Study Area in the early 1960's. For the third consecutive year, no drumming activity centers were located on the Maumee Grouse Study Area (**Table 3**). In 1980, 24 activity centers were identified and the estimated density was 5.8 grouse/100acres. Habitat on the Grouse Study Area is fairly reflective of habitat conditions on the Pleasant Run Unit of Hoosier National Forest. The 2 activity centers located in 2005 were associated with abandoned,



overgrown field openings that were already on the verge of “going by” as grouse habitat due to advancing forest succession. Since active vegetation management is not allowed under the current management prescription for this area of Hoosier National Forest, these small ephemeral pieces of grouse breeding habitat were expected to disappear.

Roadside drumming indices and Maumee density estimates show parallel downward trends over 25 years (**Figure 1**). A population model analysis for ruffed grouse in Indiana projects that ruffed grouse will not exist at viable population levels within the next decade on the Hoosier National Forest under current trends in forest succession and management (McCreedy and Basile 2004). Based on similar trends in grouse populations, forest succession, and land management, a similar fate probably faces ruffed grouse on adjacent public and private forestlands in south-central Indiana. The Knob’s sampling unit of the Continuous Forest Inventory for Indiana (Miles 2008) generally covers the primary distribution of ruffed grouse in south-central Indiana (Backs 1984). The proportion of seedling/sapling and pole timber components have progressively declined as they have matured into larger, more open saw log sized forests (**Table 4; Figure 2**).

Early forest successional stages of seedling/sapling/pole size hardwoods are the primary components of habitat for ruffed grouse, American woodcock (*Scolopax minor*) and a host of other wildlife species that were historically created by either natural disturbances (e.g. tornadoes, fire storms, insect outbreaks) across a large continuous forested landscape or within transitional zones between grasslands and forests. Early forest succession habitats and associated wildlife are undergoing significant and parallel declines in the eastern United States (See a series of papers in “Conservation of woody, early successional habitats and wildlife in the eastern United States” pages 407-494, Wildlife Society Bulletin Vol. 29, No. 2, Summer 2001). The population trends for American woodcock are nearly identical to those of ruffed grouse in Indiana (Kelley and Rau, 2006).

Ruffed grouse exist on both private and public forest lands. Private forest land ownerships in Indiana are generally small with quite varying land management objectives and parcel ownership is relatively short to allow long term, consistent timber management that would benefit ruffed grouse. Public forest lands are relatively continuous and offer the best opportunities for long term land management objectives. Until public land managers again have the flexibility and the public support to use various vegetation or timber management tools to mimic or emulate natural disturbances on what remains of the contiguous forest ecosystem, we can expect further losses in early successional habitats and dependent wildlife species on public forest lands. Ruffed grouse population levels are projected to drop below “viable population levels” within the next decade, or sooner, in portions of their existing range in south-central Indiana unless some intervention (e.g. timber harvests of sufficient intensity) or sizable natural disturbances occur across the forested landscape to create early successional forest habitats.

### Literature Cited

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Table 1. Numbers of ruffed grouse heard on roadside drumming counts in Indiana between 1 - 18 April 2008.

County / Area	Total Routes	Total Stops	Cumm.	Grouse	Cumm Total Drums	Highest Drum Count	Total No. Seen	Grouse Heard <sup>a</sup>		Drummings <sup>a</sup>	
			Total	Heard				Per Stop		Per Stop	
			Grouse Heard	Highest Count				2007	2008	2007	2008
* Jackson, Brown, Monroe (Hickory Ridge, USFS)	2	30	1	1	2	2	0	0.07	0.07	0.13	0.13
*Owen-Putnam	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00
*Perry Co. (Oriole-St. Croix-USFS)	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00
*Washington State Forest	2	30	3	2	3	2	0	0.07	0.13	0.13	0.13
**Lawrence & Orange (Lost River E, USFS)	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00
Martin & Orange (Lost River W, USFS)	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00
**Morgan-Monroe State Forest	2	30	1	1	1	1	0	0.07	0.07	0.07	0.07
**Greene	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00
**Orange (Lick Creek, USFS)	2	30	0	0	0	0	0	0.07	0.00	0.07	0.00
Jefferson	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00

<sup>a</sup> Indices calculated using route with highest count.

\* Areas surveyed annually and used as controls to index overall population trends.

\*\* New (1987) areas added as controls to broaden grouse range coverage.

Table 2. Drumming count indices along roadside control routes, 1979-2008.

Year	Male Grouse Heard Per Stop by Roadside Route *								MEAN
	HICKORY	OWPUT	PERRY	WASH	LR-EAST	MORGAN	GREENE	LICKCR	
1979	1.00	0.27	-	0.53	-	-	-	-	1.80
1980	1.27	0.53	0.60	0.73	-	-	-	-	0.78
1981	1.33	0.89	0.60	0.80	-	-	-	-	0.91
1982	0.73	0.40	0.20	1.07	-	-	-	-	0.60
1983	0.53	0.27	0.33	0.40	-	-	-	-	0.38
1984	0.93	0.20	0.33	0.00	-	-	-	-	0.37
1985	1.00	0.47	0.20	0.07	-	-	-	-	0.44
1986	1.00	0.33	0.13	0.07	-	-	-	-	0.38
1987	0.40	0.47	0.20	0.13	0.27	0.27	0.13	0.33	0.28
1988	0.33	0.13	0.07	0.07	0.33	0.33	0.27	0.47	0.25
1989	0.67	0.20	0.21	0.07	0.27	0.47	0.20	0.73	0.35
1990	0.47	0.20	0.13	0.13	0.37	0.47	0.27	0.47	0.31
1991	0.13	0.13	0.07	0.00	0.40	0.13	0.13	0.53	0.19
1992	0.13	0.13	0.13	0.00	0.27	0.07	0.27	0.40	0.18
1993	0.07	0.40	0.13	0.07	0.33	0.40	0.47	0.40	0.28
1994	0.20	0.07	0.07	0.00	0.40	0.27	0.53	0.40	0.24
1995	0.13	0.00	0.07	0.07	0.47	0.47	0.13	0.40	0.22
1996	0.13	0.27	0.07	0.00	0.33	0.27	0.07	0.20	0.17
1997	0.20	0.20	0.07	0.07	0.53	0.40	0.07	0.07	0.20
1998	0.27	0.07	0.00	0.07	0.53	0.07	0.27	0.07	0.17
1999	0.07	0.07	0.07	0.00	0.40	0.07	0.07	0.00	0.09
2000	0.13	0.20	0.00	0.00	0.27	0.07	0.20	0.13	0.13
2001	0.07	0.07	0.07	0.00	0.13	0.07	0.13	0.13	0.08
2002	0.07	0.00	0.07	0.27	0.00	0.00	0.20	0.20	0.10
2003	0.00	0.00	0.00	0.13	0.07	0.13	0.07	0.07	0.06
2004	0.00	0.00	0.07	0.13	0.13	0.13	0.00	0.00	0.06
2005	0.07	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.03
2006	0.20	0.07	0.00	0.07	0.00	0.00	0.07	0.00	0.04
2007	0.07	0.00	0.00	0.07	0.00	0.07	0.00	0.07	0.03
2008	0.07	0.00	0.00	0.13	0.00	0.07	0.00	0.00	0.03

\* = Indices calculated using route with highest count.

HICKORY = Hickory Ridge (USFS), Lawrence and Jackson Counties

OWPUT = General area of Owen-Putnam St. Forest

PERRY = northern portion of Perry Co.(USFS)

WASH = general area of Jackson-Washington St. Forest in Washington County

LR-EAST = Lost River Unit - East, USFS, Lawrence and Orange Counties.

MORGMON = general area of Morgan-Monore St. Forest in Morgan county.

GREENE = eastern Greene County

LICKCR = Lick Creek Area, USFS, in Orange County.

MEAN = Arithmetic average value for all routes

Table 3. Spring breeding densities of ruffed grouse, Maumee Grouse Study Area.

YEAR	DRUMMING ACTIVITY CENTERS *	POPULATION DENSITY Per 40 ha (100 a) **
1969	12	2.9
1970	20	4.8
1971	16	3.9
1972	19	4.6
1973	9	2.2
1974	survey not conducted	
1975	14	3.4
1976	14	3.4
1977	18	4.5
1978	20	5.0
1979	17	4.3
1980	24	5.8
1981	20	4.8
1982	19	4.6
1983	11	2.7
1984	11	2.7
1985	11	2.7
1986	14	3.4
1987	10	2.4
1988	8	1.9
1989	8	1.9
1990	16	3.9
1991	9	2.2
1992	9	2.2
1993	7	1.6
1994	4	0.9
1995	4	0.9
1996	12	2.4
1997	8	1.7
1998	7	1.6
1999	10	2.3
2000	6	1.4
2001	5	1.1
2002	6	1.4
2003	2	0.5
2004	1	0.2
2005	2	0.5
2006	0	0.0
2007	0	0.0
2008	0	0.0

\* Area covered varied from 800 to 1,000 acres; mean area covered = 875 acres.

\*\* Assumes a 50:50 sex ratio and represents a minimum because of non-drumming males (Gullion 1981)

**Figure 1. Indiana Grouse Population Trends**

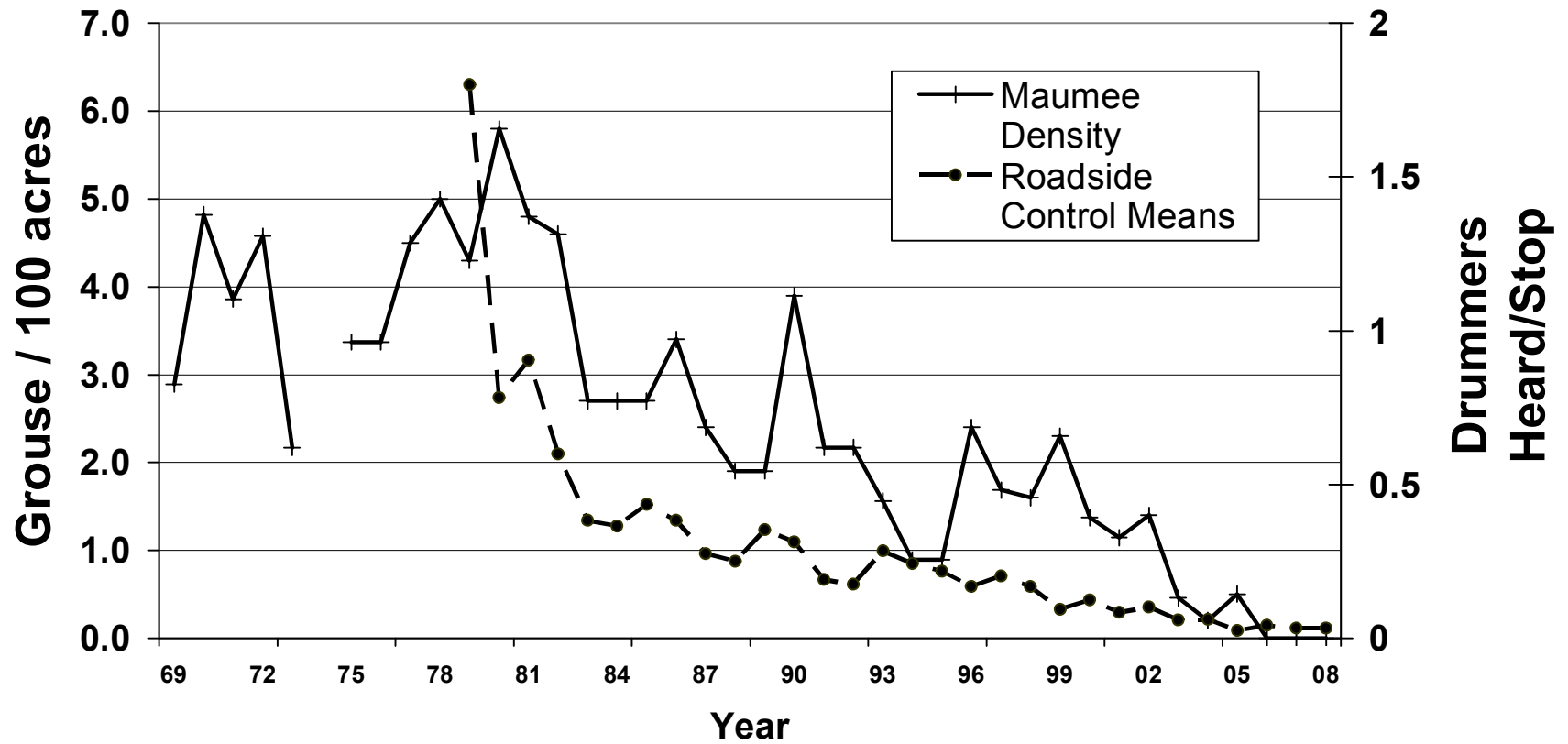


Table 4. Timber stand size-class distribution and trends, Knobs timber sampling unit, Indiana.

Timber Size-Class	Percent Composition				Rate of Change			
	1967*	1986*	1998	2005	67 to 86	86 to 98	67 to 98	98-'05
Sawtimber	46%	64%	74%	81%	38%	14%	60%	9%
Poletimber	46%	30%	21%	14%	-35%	-41%	-54%	-36%
Seedling/Sapling	8%	6%	5%	5%	-18%	-33%	-38%	0%
Seedling/Sapling/Poletimber	54%	36%	26%	19%	-33%	-28%	-52%	-36%

\* values from 1967 and 1986 inventories were transformed to format of 1998 data derivations.

**Fig. 2 Timber Size Class Distributions, Knobs Unit**

